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SEMUTOOL REF NO. P88-0001

part
of
Claim 6

subjecting the surface of the semiconductor workpiece and the deposited copper to an elevated temperature annealing process at a temperature at or below about 250 degrees Celsius for a time period of no longer than 15 minutes, which time period is sufficient to increase the grain size of the deposited copper.

(Canceled)

The number 7 is missing.

8. (Original) A method as claimed in Claim 6 wherein an electroplating waveform is used, at least in part, to ensure the sufficiently small metal grain size.

9. (Original) A method as claimed in Claim 6 wherein an electroplating solution additive is used, at least in part, to ensure the sufficiently small metal grain size.

10. (Previously presented) A method for filling recessed microstructures at a surface of a semiconductor workpiece, the workpiece including at least one low-K dielectric layer, with copper metal comprising:

depositing copper into the recessed micro-structures using an electrochemical process generating copper grains that are sufficiently small so as to substantially fill the recessed microstructures; and

subjecting the surface of the semiconductor workpiece with the deposited copper to an elevated temperature annealing process at a temperature selected to be below a predetermined temperature at which the low-K dielectric layer would suffer substantial degradation.

11. (Previously presented) A method for filling recessed microstructures at a surface of a semiconductor workpiece with copper metal comprising:

providing a semiconductor workpiece with a feature that is to be connected with copper metallization;

applying at least one low-K dielectric layer over a surface of the semiconductor workpiece including the feature;

providing recessed microstructures in the at least one low-K dielectric layer;